Title (en)

PROJECTION OPTICAL SYSTEM UNIT, PROJECTION OPTICAL SYSTEM, AND PROJECTION OPTICAL APPARATUS

Title (de)

OPTISCHE PROJEKTIONSSYSTEMEINHEIT, OPTISCHES PROJEKTIONSSYSTEM UND OPTISCHE PROJEKTIONSVORRICHTUNG

Title (fr)

UNITÉ DE SYSTÈME OPTIQUE DE PROJECTION, SYSTÈME OPTIQUE DE PROJECTION ET APPAREIL OPTIQUE DE PROJECTION

Publication

EP 3543758 A1 20190925 (EN)

Application

EP 19161381 A 20190307

Priority

JP 2018050356 A 20180319

Abstract (en)

A projection optical system (25) satisfies θ1 ≥ 15 (deg) and 3 < EP/Ym < 7. 01 is a maximum inclination angle of the reflective surface of each of the micromirrors (100) with respect to the line normal to the image display surface; EP is an entrance pupil distance of the projection optical system (25); and Ym is a maximum distance in a plane (C) from an optical axis to a point on the image display surface, the plane being a plane in which a light ray propagating from a center (LV0) of the image display surface toward the projection surface through a center of an aperture stop (S) of the projection optical system (25) exists, the optical axis being an axis shared by a largest number of the plurality of lenses (11) of the projection optical system (25), the point corresponding to an image on the projection surface.

IPC 8 full level

G02B 13/16 (2006.01); **G02B 26/08** (2006.01); **G03B 21/14** (2006.01); **H04N 9/31** (2006.01)

CPC (source: CN EP US)

G02B 13/16 (2013.01 - EP US); **G02B 26/0833** (2013.01 - EP US); **G03B 21/008** (2013.01 - CN EP US); **G03B 21/142** (2013.01 - US); **G03B 21/28** (2013.01 - EP US)

Citation (applicant)

JP 2012203139 A 20121022 - RICOH OPTICAL IND CO

Citation (search report)

- [A] EP 2597515 A1 20130529 - RICOH CO LTD [JP]
- [A] US 2013107232 A1 20130502 - TATSUNO HIBIKI [JP]
- [A] JP 2013003297 A 20130107 - KONICA MINOLTA ADVANCED LAYERS
- [A] JP 2003202492 A 20030718 - MATSUSHITA ELECTRIC IND CO LTD
- [A] JP 2006209150 A 20060810 - SEIKO EPSON CORP
- [A] JP 2010078627 A 20100408 - SUWA OPTRONICS KK

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 3543758 A1 20190925; **EP 3543758 B1 20210224**; CN 110286549 A 20190927; CN 110286549 B 20210601; JP 2019164176 A 20190926; JP 7234498 B2 20230308; US 10890840 B2 20210112; US 2019285979 A1 20190919

DOCDB simple family (application)

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